

REMARKS

Claim 1 has been amended to incorporate the dichroic residue according to claim 2 and the polymerizable group according to claim 3 and to disclaim the polymerizable dichroic azo dyes of example 3 of US 6,686,980. Claims 2 and 3 have been canceled in view of the amendment of claim 1. Other claims have been amended to correct their dependency in view of the cancellation of claims 2 and 3, or to resolve issues raised by the Examiner.

Entry of the above amendment is respectfully requested.

Objection to the Claims

On page 2 of the Office Action, in paragraph 1, claims 6-28 and 32-54 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim.

In response, Applicants have amended the claims to eliminate the improper multiple claim dependencies. Accordingly, Applicants submit that this objection has been overcome, and withdrawal of this objection is respectfully requested.

Rejection of Claims 31, 39, 41, 49-50 and 54

On page 2 of the Office Action, in paragraph 2, the Examiner indicates that claims 31, 39, 41, 49-50 and 54 provide for the use of a polymerizable dichroic dye, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. Further, claims 31, 39, 41, 49-50 and 54 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in

the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101.

In response, Applicants have amended claims 31, 39, 41, 49-50 and 54 so that they are proper method claims. Accordingly, Applicants submit that this rejection has been overcome, and withdrawal of this rejection is respectfully requested.

Rejection of Claim 3

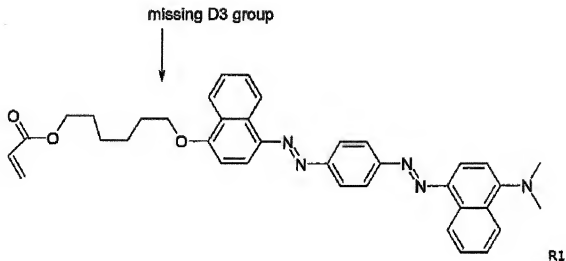
On page 2 of the Office Action, in paragraph 3, claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the word "preferably" is indefinite.

In response, Applicants note that claim 3 has been canceled, and that the other claims do not include the word "preferably". Accordingly, Applicants submit that this rejection has been overcome, and withdrawal of this rejection is respectfully requested.

Anticipation Rejection over EP '602

On page 3 of the Office Action, in paragraph 5, claims 1-5 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 1,256,602.

In response, Applicants note initially that EP '602 describes on page 15 a diazo compound of formula R1:



However, this compound R1 differs from the dyes of the present invention since the group D3, which represents an aromatic or alicyclic group, of the dye structure part B is missing.

Further, there is no disclosure provided in EP '602 that any azo dye should have an additional aromatic group D3.

Hence, the present invention is novel over EP '602.

Moreover, Applicants submit that the present invention is not obvious from EP '602 as follows.

EP '602 describes with the compound of formula R1 a dichroic dye which differs from the dichroic dye of the present invention by the missing D3 group.

However, this D3 group, which is linked in the present invention to the azo groups, forms an essential part of the dyes of the invention, because this dye structure gives access to liquid crystal mixtures with enhanced order parameters.

A person skilled in the art who has the objective to provide liquid crystal mixtures with dichroic dyes having high order parameters, would not find any hint in EP '602 that R1 should be modified to arrive at the dichroic dyes of the present invention, or how it should be modified.

Applicants submit that it was very surprising that the dichroic dyes found in the present invention give access to a mixture having such superior high order parameters.

As shown in examples 24 to 30, order parameters from 0.77 to 0.90 were gained:

dichroic dye of example 24: $S = 0.81$ (at $\lambda = 566$ nm)

dichroic dye of example 25: $S = 0.85$ (at $\lambda = 508$ nm)

dichroic dye of example 26: $S = 0.84$ (at $\lambda = 556$ nm)

dichroic dye of example 27: $S = 0.84$ (at $\lambda = 600$ nm)

dichroic dye of example 28: $S = 0.90$ (at $\lambda = 566$ nm)

dichroic dye of example 29: $S = 0.77$ (at $\lambda = 456$ nm)

dichroic dye of example 30: $S = 0.82$ (at $\lambda = 578$ nm)

These examples are representative of the accessed high order parameters of all dichroic dyes of the present invention, since the high order parameters are dependent on the general structure concept of the molecules, which is identical for the dyes of the invention, wherein a dichroic building block is elongated to gain a rod shape structure similar to liquid crystals.

These results could not be expected by starting with the teaching of EP '602, without an undue number of trials and errors.

Hence, the present invention is non-obvious over the teaching of EP '602.

There is also no further prior art providing any hint that the teaching of EP '602 should be combined with any other teaching, or how it should be combined, to arrive at the dichroic dyes of the present invention.

Therefore, Applicants submit that the present invention is patentable over the cited art, and withdrawal of this rejection is respectfully requested.

Anticipation Rejection over Ichihashi

On page 6 of the Office Action, in paragraph 7, claims 1-5 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Ichihashi (JP 2001133630 or equivalent US 6,686,980).

In response, Applicants note initially that the polymerizable dichroic azo dyes of example 3 of US 6,686,980 are disclaimed in the amended claims.

Applicants submit that the disclosure of these dyes in US 6,686,980 is an accidental disclosure. There is no process described how these dyes are accessible. These dyes are also not encompassed by the scope of the generic chemical structure of azo dyes in columns 3 and 4 of US 6,686,980.

Hence, the present invention is novel over US 6,686,980.

Further, in the present application it was surprisingly found that especially such polymerizable dichroic dyes, which have an elongated shape and a large ratio of molecular length to width, give access to excellent mixtures with liquid crystals having high order parameters. To assure an elongated shape, the dyes of the present invention have a substantially linear arrangement of aromatic or alicyclic rings, such as the shape enlarging group B, which is bound to the dichroic residue A, which is built from the azo part of the dye.

The examples 24 to 30 show that indeed high order parameters from $S = 0.77$ to $S = 0.9$ are accessible with the dyes of the invention.

Therefore, Applicants submit that the present invention is not even obvious over the teaching of US 6,686,980.

Thus, Applicants submit that the present invention is patentable over the cited art, and withdrawal of this rejection is respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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